

INFORMATION SHEET

ORDER NO.
AMADOR WATER AGENCY
MACE MEADOWS GOLF AND COUNTRY CLUB, INC.
BUCKHORN WATER TREATMENT PLANT AND REUSE SITE
AMADOR COUNTY

Background

The Amador Water Agency (AWA) owns and operates the Buckhorn WTP and backwash wastewater conveyance line. Backwash water (i.e., wastewater) will be stored and reused via irrigation on the Mace Meadows Golf Course. The golf course is owned and operated by Mace Meadows Golf and Country Club, Inc.

The existing Buckhorn WTP, which treats raw water from the North Fork Mokelumne and Bear River watersheds for distribution as treated potable water to ten water districts in east central Amador County, is being replaced and upgraded. The new WTP is being constructed and sized with a 2 million gallon per day (mgd) peak day capacity, expandable to 5 mgd capacity in the future. This Order only addresses the 2 mgd facility.

Water treatment at the new WTP consists of a membrane micro-filtration system (MicrozaTM). Water purification is dependent on the process of small pore filtration and will not require chemical additions such as polymers due to the high quality of the raw water. Monthly, or as needed, the membranes will be cleaned by a two-step clean-in-place process that will include caustic/chlorine and citric acid. Clean-in-place waste will not be part of the wastewater conveyed to the golf course for irrigation. Clean-in-place waste will be stored in a 10,000 gallon below ground tank and trucked to a County operated landfill for disposal on an as-needed basis. Additional and more frequent membrane cleaning will be accomplished by backwashing membranes up to two to three times per hour depending on trans-membrane pressure differentials. Membranes will be backwashed with potable water. Based on pilot testing, the new WTP is predicted to be approximately 96 percent efficient; wastewater production will be approximately 4 percent, or 80,000 gallons per day at 2 mgd peak day production. The Discharger estimates that approximately 55 acre-feet of filter backwash wastewater will be produced on an annual basis when the WTP operates at 2.0 mgd capacity.

The wastewater will be delivered to the Mace Meadows Golf Course and stored in two existing golf course storage ponds (Ponds 7 and 8). Currently, Pond Nos. 7 and 8 provide approximately 20 acre-feet of storage. Wastewater will be used to irrigate the golf course during the dry months of the year (typically May through October). The total disposal area will consist of approximately 65 acres. The golf course's irrigation system includes approximately 700 sprinkler heads in 28 irrigation zones. Tailwater runoff will be controlled by applying wastewater when evapotranspiration needs exceed available rainfall, and then only at rates which do not exceed infiltration into soil. Because wastewater alone cannot meet the golf course's irrigation demand, wastewater will be applied intermittently. Wastewater will be supplemented with groundwater obtained from potable water wells at the golf course.

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The water balance provided in the RWD indicates that Pond Nos. 7 and 8 will provide adequate storage capacity based on average annual rainfall condition and the amount of wastewater generated from the 2.0 mgd WTP. However, the water balance prepared for 100-year annual rainfall conditions indicate that Pond Nos. 7 and 8 will not have sufficient storage capacity based on wastewater generated from the 2.0 mgd WTP. An additional 11-acre feet of winter storage is needed to have sufficient winter storage capacity. This Order allows the discharge of wastewater generated from a 2.0 mgd WTP. This Order provides a timeline for the Discharger to construct additional winter storage capacity to meet 100-year annual rainfall conditions, and submit a engineering report documenting that the facility has sufficient winter storage capacity.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage from the wastewater storage and reuse areas is to Pioneer Creek, a tributary to Sutter Creek, which is in turn tributary to Dry Creek, and then the Calaveras River. The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic supply in this instance) of groundwater, procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

Antidegradation

The antidegradation directives of Section 13000 of the California Water Code require that waters of the State that are better in quality than established water quality objectives be maintained “consistent with the maximum benefit to the people of the State.” Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Water Board Resolution No. 68-16, “Statement of Policy With Respect to Maintaining High Quality Waters in California,” or “Antidegradation” Policy).

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Board to evaluate that fully characterizes:

- All waste constituents to be discharged;
- The background quality of the uppermost layer of the uppermost aquifer;
- The background quality of other waters that may be affected;
- The underlying hydrogeologic conditions;
- Waste treatment and control measures;
- How treatment and control measures are justified as best practicable treatment and control;
- The extent the discharge will impact the quality of each aquifer; and

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- The expected degree of degradation.

In allowing a discharge, the Regional Board must comply with CWC section 13263 in setting appropriate conditions. The Regional Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

Some degradation of the groundwater for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of municipal water treatment plant far outweigh the environmental impact damage of a community that would otherwise be reliant on numerous concentrated domestic wells. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate this wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the maximum benefit to the people of the State.

Groundwater monitoring has never been conducted at the site and therefore staff are unable to establish the most appropriate groundwater limits. In addition, certain aspects of treatment and control practices may not be justified as representative of best practicable treatment and control (BPTC). Reasonable time is necessary to gather specific information about the WTP and reclamation site to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes interim receiving water limitations to assure protection of the beneficial uses of groundwater of the State pending the completion of certain tasks and provides time schedules to complete specified tasks. During this period, degradation may occur from certain constituents, but can never exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance.

Water quality objectives define the least stringent limits that could apply to groundwater at this location, except where natural background quality unaffected by the discharge of waste already exceeds the objective. The values below reflect water quality objectives that must be met to maintain specific beneficial uses of groundwater. Unless natural background for a constituent proves higher, the groundwater quality limit established in proposed Order is the most stringent of the values listed for the listed constituents.

<u>Constituent</u>	<u>Units</u>	<u>Value</u>	<u>Beneficial Use</u>	<u>Criteria or Justification</u>
Ammonia	mg/L	1.5	MUN ¹	Taste and Odor ²
Boron	mg/l	0.7	AGR ³	Boron Sensitivity ⁴
Chloride	mg/L	106	AGR ³	Chloride sensitivity on certain crops irrigated via sprinklers ⁴
		142	AGR ³	Chloride sensitivity on certain crops ⁴
		250	MUN ¹	Recommended Secondary MCL ⁵
		500	MUN ¹	Upper Secondary MCL ⁵

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<u>Constituent</u>	<u>Units</u>	<u>Value</u>	<u>Beneficial Use</u>	<u>Criteria or Justification</u>
Iron	mg/L	0.3	MUN ¹	Secondary MCL ⁶
Manganese	mg/L	0.05	MUN ¹	Secondary MCL ⁶
Nitrate as N	mg/L	10	MUN ¹	Primary MCL ⁷
Nitrite as N	mg/L	1	MUN ¹	Primary MCL ⁷
Total Nitrogen	mg/L	10	MUN ¹	Primary MCL ¹¹
Sodium	mg/L	69	AGR ³	Sodium sensitivity on certain crops ⁴
Total Dissolved Solids	mg/L	450 ⁸	AGR ³	Salt sensitivity for certain crops ⁴
		500	MUN ¹	Recommended Secondary MCL ⁵
		1,000	MUN ¹	Upper Secondary MCL ⁵
		Less than	MUN ¹	Basin Plan
Total Coliform Organisms	MPN/100 ml	2.2		
Trihalomethanes	µg/L	80	MUN ¹	Federal MCL ¹³
Bromoform	µg/L	4	MUN ¹	USEPA Cancer Risk Estimate ⁹
Bromodichloromethane	µg/L	0.27	MUN ¹	Cal/EPA Cancer Potency Factor ¹⁰
Chloroform	µg/L	1.1	MUN ¹	Cal/EPA Cancer Potency Factor ¹⁰
Dibromochloromethane	µg/L	0.37	MUN ¹	Cal/EPA Cancer Potency Factor ¹⁰
pH	pH Units	6.5 to 8.5	MUN ¹	USEPA Secondary MCL ¹²
		6.5 to 8.4	AGR ³	Irrigation of crops ⁴

- 1 Municipal and domestic supply.
- 2 J.E. Amore and E. Hautala, *Odor as an Aid to Chemical Safety : Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, *Journal of Applied Toxicology*, Vol. 3, No. 6 (1983).
- 3 Agricultural supply.
- 4 Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).
- 5 Title 22, California Code of Regulations (CCR), section 64449, Table 64449-B.
- 6 Title 22, CCR, Section 64449, Table 64449-A.
- 7 Title 22, CCR, Section 64431, Table 64431-A.
- 8 Title 22, CCR, Section 64439.
- 9 USEPA Integrated Risk Information System.
- 10 Cal/EPA Toxicity Criteria Database (OEHHA).
- 11 Assumes that, over time, all nitrogen species will convert to nitrate or nitrite.
- 12 40 Code of Federal Regulations, 143.3
- 13 40 Code of Federal Regulations, 141.64

Wastewater contains numerous dissolved inorganic waste constituents (i.e., salts, minerals) that together comprise total dissolved solids (TDS). Each component constituent is not individually critical to any beneficial use. Critical constituents are individually listed. The cumulative impact from these other constituents, along with the cumulative affect of the constituents that are individually listed can be effectively controlled using TDS as a generic indicator parameter.

Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride tends to pass through both rapidly to groundwater. As chloride concentrations in most groundwaters in the region are much lower than in treated municipal wastewater, chloride is a useful indicator parameter for evaluating the extent to which effluent reaches groundwater. Boron is another TDS constituent that may occur in wastewater in concentrations greater than groundwater depending on

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the source water, to the extent residents use cleaning products containing boron, and whether any industrial dischargers utilize boron (e.g., glass production, cosmetics). Other indicator constituents for monitoring for groundwater degradation due to recharged effluent include total coliform bacteria, ammonia, total nitrogen, and Total Trihalomethanes (TTHMs), a by-product of chlorination.

Proposed Order Terms and Conditions

Discharge Prohibitions and Specifications

It is not practical to prescribe a monthly average flow limit for the wastewater discharged from this plant, as the amount of water treated (and therefore the amount of wastewater generated) will vary significantly throughout the year. Therefore, the proposed Order establishes a flow limit not to exceed the amount of backwash water generated from a 2 mgd water treatment plant, and wastewater flows into the wastewater storage ponds not exceed 55 acre-feet per calendar year. The water balance provided with the RWD shows that the golf course can adequately dispose of this volume of waste. However, the golf course storage ponds currently do not have sufficient winter storage capacity based on 100 year precipitation conditions. This Order provides a timeline for the Discharger to construct additional storage capacity.

The proposed Order's discharge specifications for TDS, Total Coliform, and Total Nitrogen are based on the treatment technologies employed. The discharge specifications regarding dissolved oxygen and freeboard are consistent with Regional Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

Monitoring Requirements

Section 13267 of the CWC authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The proposed Order requires influent and effluent monitoring requirements, as well as wastewater storage pond and reuse areas requirements. In order to adequately characterize its wastewater, the Discharger is required to monitor for total coliform organisms, TDS, sodium, chloride, nitrates, and pH. Monitoring of additional minerals is required on an annual basis. To ensure that disposal ponds do not create nuisance conditions, the Discharger is required to monitor freeboard available and dissolved oxygen content weekly.

In order to determine compliance with Resolution No. 68-16, this Order sets effluent limits. If the waste quality exceeds these limits, then the Discharger must evaluate the potential impact on the underlying groundwater and assess whether groundwater monitoring wells should be installed. If groundwater has been degraded, then the Discharger will be required to evaluate and implement BPTC measures for each conveyance, treatment, storage, and disposal component of the system. Completion of these tasks will

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ensure that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop final effluent and groundwater limitations, so the proposed Order contains interim limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and regulations may change is not sufficient basis for reopening the Order. The CWC requires that waste discharge requirements implement all applicable requirements.

JSK: 3/29/05